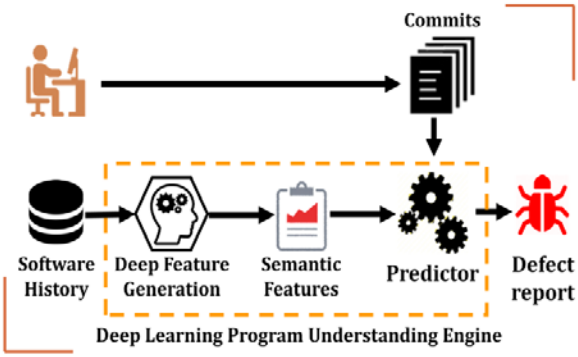
TECHNOLOGY SUMMARY

AI Deep Defect and Vulnerability Prediction

DEEPTECT

AI Deep Prediction



Reference
8810-7422

Patent status
PCT Patent filed

Sectors
Software dependability
Automated Test & Verification Tools
Information Technology

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Description of the Invention

Software defects (i.e., bugs) significantly impair software quality and dependability and cost the global economy over $300 billion dollars annually. More than 80% of software development budget is spent on quality control. There is a high demand for effective automated test and bug detection tools using AI and Machine Learning to improve software quality and dependability.

The market for Automated Test & Verification Tools is expected to grow from $3.31 billion in 2016 to $7.61 billion by 2021, at an estimated compound annual growth rate of 18.1%.

Waterloo researchers have developed deep defect and vulnerability prediction AI software that will help developers develop high-quality software faster and at reduced cost. The technology utilizes deep learning techniques to automatically build more accurate prediction models to identify suspicious code regions (e.g., code commits and files) that contain defects and vulnerabilities. In addition, the software provides actionable feedback, including detailed locations and concise explanations for the prediction results, that developers can use to fix the vulnerabilities.

Advantages

- Just-in-time defect and security vulnerability prediction service for source code commits and files using Machine Learning
- Detection of new classes of bugs with higher accuracy
- Actionable prediction results with explanations
- Deep-learning-based program representation
- Higher quality software with shorter development time and reduced cost

Potential customers

- Software companies
- E-commerce companies
- Manufacturing organizations
- Aerospace and defense companies
- Many others …

Development status

- Prototype developed
- 100+ bugs found in high-profile open source software
- In-lab product testing